

MAY 17.

The President, SAMUEL G. DIXON, M.D., in the Chair.

Thirty-six persons present.

The deaths of Maxwell Sommerville, a member, May 5, and of Henry M. Stanley, a correspondent, May 10, were announced.

The Publication Committee reported that a paper entitled "New Polychæta from California," by J. Percy Moore, had been offered for publication (May 16).

*Summer Activity of Some Spring Flowers.*—DR. IDA KELLER remarked that the suddenness with which the first warm days of spring call into being the so-called "spring flowers" is a yearly repeated surprise, and although the following summer months are characterized by conditions far more conducive to vegetative activity, we are accustomed to find the plants which were conspicuous in April, May and June sinking gradually into insignificance. Their time of active service seems, therefore, to be confined within narrow limits.

The slightest acquaintance with the laws governing plant physiology leads to the conclusion that the complex structures thus quickly appearing are in reality the result of the usual slow and elaborate processes of the various phases of metabolism, and indeed close observation shows that at least some of our well-known species are busily at work during the entire summer, preparing with great care and circumspection for the sensational outburst of the vernal season.

No better illustration of this point could be found than the May-apple. It is interesting to dig in the soil about these plants in July or early August. Close to the surface the trowel is impeded by a network of tough stems. Instead of growing upward, these formidable structures run parallel to the surface, or they run diagonally downward, or perhaps they may even point vertically downward, in defiance to the laws of geotropism. The stems are anchored in the ground by rather stout roots which come off at various points, and each stem is terminated by a large bud. Lateral buds are also to be found. At this time of the year the overground portion is in a process of slow decomposition. The decaying leaf-stalk gives no evidence of this underground activity, as a result of which we have great patches of *Podophyllum* early the following year.

While making these observations she had also noticed the False Solomon's Seal. The flowering plants of the season had produced fruit, but there were also many younger plants which had not yet reached the flowering stage. On none of the plants were long underground stems visible, but their rhizomes were all well supplied with

conspicuous buds. It was worthy of notice that the plants which were too immature to produce flower and seed readily form several underground buds, indicating that the latter method of reproduction takes place at an earlier stage than that of seed formation. Owing to this wise arrangement the danger of extermination from the ravages of enthusiastic collectors is much reduced, since the plants thus reproduce freely at this early stage of their existence without offering any temptation to the hunters of wild flowers, who abound in the woods at this time of year.

By far the most interesting observations on this underground method of reproduction were made on *Arisæma triphyllum*.

On the 27th of July a locality was found on Crum creek where the plants were very plentiful and in the various stages of development. At the time of year mentioned the fruit was formed, and while still green in color it showed a tendency to turn red. Below was the thick corm and the two leaves were showing symptoms of decay by their yellowish tinge. In some cases the leaves had already dropped off completely. In one case the corm was of the same shape as that of the mature plant, namely, depressed globose, while in another the form was markedly different, being decidedly elongated and at the free end there was the appearance of a scar, indicating some previous attachment. It was these longish corms which appeared to indicate some hidden meaning and which led her to continue the observation in regard to their origin and significance.

Some years ago, in a short paper entitled *Underground Runners*, she had called attention to peculiar growths on *Arisæma triphyllum* as found in April. At that time of year they were small knob-like projections on the corm, while in July these formations were at least an inch in length. There may be several of them on the same corm, nor are they restricted to the mature plants. This species also reproduces freely before it reaches the flowering age and thus decreases the chances of extermination. This may partially explain the persistence of the plant in our woods in spite of the fact that it is one of the favorites of the enthusiastic collectors before mentioned.

She had found that these structures drop off very readily, and was much impressed with this peculiarity. In fact, it seemed impossible to keep a corm and its growth intact. On close inspection it appeared that there had been a separation between the main body of the corm and the structure even before they were disturbed. The attachment was entirely superficial, being simply due to a layer of skin which loosely covered and hid the point of separation. The body is somewhat bean-shaped, the bulk being made up of nourishing material, while the apex is occupied by the terminal bud and the scar at the base marks the point where it was originally connected with the parent plant. A space already indicated the separation. Although still loosely united by the skin above alluded to, each of the two structures is prepared for an independent existence.

On the 20th of September she again observed the patches with the view of determining the sequel of the interesting story. By this time

most of the plants had died down, the still remaining leaves were yellowish and in a state of decay. The red fruits were numerous, and it did not seem as though the plants were in immediate danger of extermination, even if their sole method of propagation were by seed. On uprooting some, she had found that the growths had been completely severed from the parent corms, and that, in fact, they seemed to be moving away from them. It is a significant fact that we do not find the Jack-in-the-pulpit growing close together in tufts, as would naturally follow were these short underground growths to develop in connection with the corms from which they spring. The result of the spontaneous loosening leads naturally to a prevention of this condition. Future observations must determine just how far the young corms may travel from the spot where they had their origin. The elongated form terminated by a point would offer but slight resistance to any force which would tend to carry them away. Thus we find in this plant a rather unusual form of reproductive bodies in these underground sprouts and probably also an unusual method of dissemination.

A considerable amount of activity is manifested in the formation of these bodies, but this by no means represents the entire summer work of this typical spring flower, even aside from the fruit formation. On removing the decaying stems from the plant, a large pinkish, whole-some bud comes into view. Within the three heavy protecting sheaths the Jack-in-the-pulpit is completely formed in miniature. The leaf is unmistakable in its form, standing bolt upright, even emphasizing the peculiarity of the adult leaf. Close to it is the inflorescence with a fully formed spathe and the flowers within are marked by well-defined masses of cells. Thus all is in readiness for the first warm days of the following spring.

To some extent the same is true of *Podophyllum*. In the vigorous buds terminating the underground stems, described above, the leaf and flower are also plainly formed. It is also true of *Smitacina racemosa*, though perhaps to a less degree. Here the future raceme is foreshadowed by the characteristic shape of the vegetative point.

We may safely conclude, therefore, that the summer months are also a busy season with these spring flowers. We can appreciate how heavy the demands are on the vegetative activity of the leaves of *Arisema triphyllum* when we remember that one current must carry nutrition to the forming fruit, at least in the seed-bearing plants, another stream travelling in the opposite direction must provide for the food supply of the miniature plant in the bud, and also for the formation of the underground reproductive bodies above described. The season is indeed one full of activity up to the time when its close is marked by the fruit dropping heavily from the exhausted stalk.

Henry D. Jordan, M.D., and James Harold Austin were elected members.

The following were ordered to be printed: